

Amendments to the Claims

Please replace claims 1-77 with the following amended claims 1- 82:

1-8. (canceled)

9. (currently amended) A trocar, comprising:

a cannula having a first end, and a second end, and an axis, the second end having at least one first bearing surface;

an obturator adapted for axial and rotational movement within the cannula and comprising an elongated shaft having a pointed end and an end comprising a cap assembly having at least one second bearing surface adapted to cooperate with slidably engage the first bearing surface and axially move the obturator when the obturator is rotated relative to the cannula.

; and

~~means for slidably engaging the first bearing surface and the second bearing surface whereby the obturator is deflected relative to the cannula.~~

10. (canceled)

11. (previously presented) The trocar as recited in claim 9, wherein at least one of the first bearing surface and the second bearing surface comprise an inclined surface.

12. (previously presented) The trocar as recited in claim 9, wherein at least one of the first bearing surface and the second bearing surface comprise the surface of one of a projection, a recess, and a boss.

13. (previously presented) The trocar as recited in claim 9, wherein at least one of the first bearing surface and the second bearing surface comprise one of a linear and a curvilinear surface.

14-21. (canceled)

22. (currently amended) A trocar comprising:

an obturator comprising an elongated shaft having an axis and an outside diameter; a first end having a tip adapted for insertion into tissue, the first end having a maximum diameter; and a second end; and

a cannula having an open first end having an inside surface and a first inside diameter, and an open second end adapted for receiving the obturator;

wherein the inside surface of the first end of the cannula is flexible, smooth, and continuous, and the first inside diameter of the first end of the cannula is smaller than the maximum diameter of the first end of the obturator.

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23. (previously presented) The trocar as recited in claim 22, wherein the inside surface of the first end of the cannula is uniformly tapered from a second inside diameter, larger than the first inside diameter, to the first inside diameter.

24. (Canceled)

25. (previously presented) The trocar as recited in claim 22, wherein the first end of the obturator comprises a first tapered surface extending from the maximum diameter of the first end to the tip.

26. (currently amended) The trocar as recited in claim 22-25, wherein the first end of the obturator further comprises a second tapered surface extending from the maximum diameter to the outside diameter of the shaft.

27. (withdrawn) A method for removing an obturator from a trocar, the method comprising:

providing an obturator having an elongated shaft and a tip, the tip having a first diameter;

providing a cannula having an elongated tube, the tube have a flexible open end having an inside diameter, the inside diameter being less than the first diameter of the tip of the obturator;

holding the cannula in a relatively stationary position;

radially deflecting the open end of the cannula to increase the inside diameter of the open end;

passing the tip of the obturator through the increased inside diameter of the open end of the cannula; and

withdrawing the obturator from the cannula.

28. (withdrawn) The method as recited in claim 27 wherein the radially deflecting the open end of the cannula comprises impinging the tip of the obturator against the inside diameter of the open end of the cannula.

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29. (withdrawn) The method as recited in claim 27, wherein the radial deflection of the open end of the cannula comprises an elastic deflection.

30. (withdrawn) The method as recited in claim 27, wherein the cannula further comprises at least one first bearing surface and the obturator further comprises at least one second bearing surface adapted to cooperate with the first bearing surface, wherein radially deflecting the open end of the cannula comprises:

rotating the obturator relative to the cannula;

slidably engaging the first bearing surface against the second bearing surface whereby the obturator is deflected relative to the cannula; and

impinging and deflecting the inside diameter of the open end of the cannula with the tip of the obturator.

31. (currently amended) A trocar comprising:

a cannula having a first end and a second end, the first end having an outside surface and an inside diameter, the second end having a head assembly, the head assembly having at least one first bearing surface; and

an obturator comprising a shaft, a first end having a tip, a second end, and an axis directed along the direction of elongation of the shaft; the first end of the obturator having a maximum diameter, a first tapered surface extending from the maximum diameter to the tip, and a second tapered surface extending from the maximum diameter to the outside diameter of the shaft; the second end of the obturator having a cap assembly, the cap assembly having at least one second bearing surface adapted for slidably engaging the first bearing surface of the cannula head assembly;

wherein at least one of the first bearing surface and the second bearing surface ~~are~~ is inclined relative to the axis of the obturator ~~whereby~~ wherein when the obturator is rotated about its axis, the second bearing surface slidably engages the first bearing surface and axially deflects the obturator ~~whereby~~ wherein the second tapered surface of the first end of the obturator impinges and deflects the inside diameter of the first end of the cannula ~~whereby~~ wherein the maximum diameter of the obturator can pass through the open first end of the cannula and the obturator can be removed.

32. (withdrawn) A method of using a trocar, the trocar comprising an obturator having a tip and a cannula having a flexible open end, the method comprising:
inserting the trocar into a body cavity;
slidably engaging a bearing surface on the cannula against a bearing surface on the obturator thereby deflecting the obturator relative to the cannula;
impinging the tip of the obturator against an open end of the cannula and enlarging the open end of the cannula;
passing the tip of the obturator through the enlarged open end of the cannula;
and
withdrawing the obturator from the cannula.

33. (withdrawn) The method as recited in claim 32 wherein slidably engaging the bearing surfaces is practiced by rotating the obturator relative to the cannula.

34. (withdrawn) The method as recited in claim 32 wherein the bearing surface

on the cannula is moveable relative to the cannula.

35. (withdrawn) The method as recited in claim 32 wherein the bearing surface on the obturator is moveable relative to the obturator.

36. (withdrawn) The method as recited in claim 32, further comprising passing surgical instruments through the cannula into the body cavity.

37. (withdrawn) The method as recited in claim 32, wherein the deflection of the obturator relative to the cannula is an axial deflection.

38. (withdrawn) The method as recited in claim 37, wherein the axial deflection deflects the obturator out of the body cavity.

39. (withdrawn) The trocar as recited in claim 31, wherein the outside surface of the first end of the cannula is smooth and continuous.

40. (withdrawn) The method of claim 27, wherein the open end of the cannula tube is smooth and continuous.

41. (canceled)

42. (withdrawn) The method as recited in claim 27, wherein the cannula further comprises at least one first bearing surface and the obturator further comprises at least one second bearing surface adapted to cooperate with the first bearing surface, wherein the radially deflecting the open end of the cannula comprises:

slidably engaging the first bearing surface against the second bearing surface whereby the obturator is deflected relative to the cannula; and

impinging and deflecting the inside diameter of the open end of the cannula with the tip of the obturator.

43. (withdrawn) The method as recited in claim 42, wherein the first bearing surface is moveable relative to the cannula.

44. (withdrawn) The method as recited in claim 42, wherein the second bearing surface is moveable relative to the obturator.

45-47. (canceled)

48. (previously presented) The trocar as recited in claim 9, wherein the first bearing surface is moveable relative to the cannula.

49. (previously presented) The trocar as recited in claim 9, wherein the second bearing surface is moveable relative to the obturator.

50. (withdrawn) The trocar as recited in claim 48, wherein the first bearing surface comprises the surface of one of a wedge, a lever, a cam, a bar, a linkage, and a screw.

51. (withdrawn) The trocar as recited in claim 49, wherein the second bearing surface comprises the surface of one of a wedge, a lever, a cam, a bar, a linkage, and a screw.

52. (canceled)

53. (canceled)

54. (previously presented) The trocar as recited in claim 31, wherein the head assembly includes a flexible seal which permits the passage of the obturator with little or no fluid leakage.

55-58. (canceled)

59. (previously presented) The trocar as recited in claim 9, wherein the second end of the cannula comprises a head assembly.

60. (previously presented) The trocar as recited in claim 59, wherein the head assembly comprises the at least one bearing surface.

61. (previously presented) The trocar as recited in claim 60, wherein the at least bearing surface comprises an inclined surface.

62. (previously presented) The trocar as recited in claim 59, wherein the head assembly comprises a seal which permits the passage of the obturator through the head assembly with little or no fluid leakage.

63. (previously presented) The trocar as recited in claim 59, wherein the head assembly further comprises a fluid port.

64. (previously presented) The trocar as recited in claim 61, wherein the fluid port includes a valve.

65. (previously presented) The trocar as recited in claim 9, wherein at least one of the cannula and the obturator is non-metallic.

66. (previously presented) The trocar as recited in claim 22, wherein the open second end of the cannula comprises a head assembly.

67. (previously presented) The trocar as recited in claim 66, wherein the head assembly comprises the at least one bearing surface.

68. (previously presented) The trocar as recited in claim 67, wherein the at least one bearing surface comprises an inclined surface.

69. (previously presented) The trocar as recited in claim 66, wherein the head assembly comprises a seal which permits the passage of the obturator through the head assembly with little or no fluid leakage.

70. (previously presented) The trocar as recited in claim 66, wherein the head assembly further comprises a fluid port.

71. (previously presented) The trocar as recited in claim 70, wherein the fluid port includes a valve.

72. (previously presented) The trocar as recited in claim 22, wherein at least one of the cannula and the obturator is non-metallic.

73. (previously presented) The trocar as recited in claim 22, wherein the open second end of the cannula comprises a head assembly.

74. (previously presented) The trocar as recited in claim 31, wherein the head assembly comprises a seal which permits the passage of the obturator through the head assembly with little or no fluid leakage.

75. (previously presented) The trocar as recited in claim 31, wherein the head assembly further comprises a fluid port.

76. (previously presented) The trocar as recited in claim 75, wherein the fluid port includes a valve.

77. (previously presented) The trocar as recited in claim 31, wherein at least one of the cannula and the obturator is non-metallic.

78. (new) A trocar comprising:

an elongated cannula member having a first camming surface formed on a proximal end thereof;

an elongated obturator adapted to be inserted into the cannula for rotational and axial movement therein; and

a cap formed on a proximal end of the obturator, said cap having a second camming surface positioned thereon for engagement with the first camming surface when the obturator is inserted into the cannula,

said first and second camming surfaces being effective to cause axial displacement of the obturator with respect to the cannula when the obturator cap is rotated with respect to the cannula member.

79. (new) The trocar as recited in claim 78, wherein the elongated obturator comprises a pointed distal end.

80. (new) The trocar as recited in claim 78, wherein at least one of the first camming surface and the second camming surface comprise an inclined surface.

81. (new) The trocar as recited in claim 78, wherein at least one of the first camming surface and the second camming surface comprise one of a projection, a recess, and a boss.

82. (new) The trocar as recited in claim 78, wherein at least one of the first camming surface and the second camming surface comprise one of a linear and a curvilinear surface.